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| EXAMINER |
|---|
| BRIER, JEFFERY A |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2672 | 11 |

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>16 September 2003</u> .

2a)☒ This action is **FINAL.**    2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>2-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>2 and 4</u> is/are allowed.

6)☒ Claim(s) <u>3,5-10,12-16,18-22,24 and 25</u> is/are rejected.

7)☒ Claim(s) <u>11,17 and 23</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 March 2000</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

| | |
|---|---|
| 1)☒ Notice of References Cited (PTO-892) | 4)☐ Interview Summary (PTO-413) Paper No(s). _____ . |
| 2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5)☐ Notice of Informal Patent Application (PTO-152) |
| 3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6)☐ Other: . |

## *Continued Examination Under 37 CFR 1.114*

1.      A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection.  Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114.  Applicant's submission filed on

08/18/03 has been entered.

## Response to Arguments

2.      Applicants arguments filed on 08/18/03 have been fully considered but they are

not deemed to be persuasive in overcoming the 102 and 103 rejections based upon the

Lin reference.

Applicants specification at page 8 lines 6-9 describes smoothing graphics with a

gaussian convolution kernel and sharpening text with a cubic convolution kernel.  The

rejected claims claim wherein the available convolution kernels include at least one

smoothing kernel and at least one sharpening kernel.  Thus, the rejected claims broadly

claim the sharpening kernel.

The Lin reference teaches filtering text differently than the background image.  At

column 3 lines 1-5 Lin describes using a gaussian filter to filter the background and

using a gaussian plus a sigmoid filter to filter the text.  At lines 5-11 the text filtering is

described as making the text pixels more visible when they are merged with the

background, thus the text is being made sharper. At column 6 lines 21-22, 37 and 59 the kernel for the text is described as being different than the kernel used for the background. It is clear from reviewing the kernels used for the background and the text that the kernel used for the text will sharpen text since the center pixel is emphasized more than the edge pixels and the kernel used for the background will smooth the background since the center pixel is emphasized less than the edge pixel. In addition the filtered text is applied to a sigmoid filter to further sharpen the text. Therefore, Lin teaches the broadly claimed wherein the available convolution kernels include at least one smoothing kernel and at least one sharpening kernel.

Applicants position is the Lin reference does not teach a sharpening filter but rather teaches two smoothing kernels having differing degrees of smoothness, applicants arguments at page 12.

The rejected claims broadly claim the sharpening kernel, thus, any kernel that sharpens relative to a kernel that smoothes is a sharpening kernel even though it does not perfectly sharpen.

Lin is concerned with sharpening text relative to the background during separate filtering of the text and background, thus, the kernel applied to the text which does sharpen the text relative to the kernel applied to the background is a kernel that sharpens, thus, the kernel applied to the text is a sharpening kernel.

Therefore, applicants arguments are not persuasive in overcoming the rejections based upon the Lin reference.

## *Drawings*

3.      New corrected drawings are required in this application because the quality of

the drawings are poor and poorly hand written letters and numbers are present.  Also

see the PTO-948 mailed with paper no. 5.   Applicant is advised to employ the services

of a competent patent draftsperson outside the Office, as the U.S. Patent and

Trademark Office no longer prepares new drawings. The corrected drawings are

required in reply to the Office action to avoid abandonment of the application. The

requirement for corrected drawings will not be held in abeyance.

## *Claim Rejections - 35 USC § 102*

4.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

5.      Claims 5, 3, 6, 8, 10, 12, 14, 16, 18, 20, 22, and 24 are rejected under 35 U.S.C.

102(e) as being anticipated by Lin, U.S. Patent No. 6,044,178. Figures 2 and 3, column

1 lines 6-12, column 2 lines 56-67 and column 5 line 58 to column 6 line 4 describes

scaling a source image to produce a destination image.  The following detailed analysis

illustrates how Lin teaches applicants claimed invention.

Claim 5:

Lin teaches a method for scaling a source image (figure 2, S) to produce a

scaled destination image (figure 3, output of image merging unit 96),  said method

comprising the steps of calculating a local context metric from a local portion of the

source image (*column 2 lines 56-58, column 4 lines 47-50, and column 5 lines 5-12 and*

*21-34, text segmentation unit 58 and image separation unit 66, Lin divides the image*

*into tiles and determines the tile's metric*);  generating a convolution kernel from a

plurality of available convolution kernels (*column 6 lines 21-22, 37 and 58*) based on the

calculated local context metric (*depending upon the tile's values one of three*

*convolution kernels is selected to be applied to the tile*);  using the generated

convolution kernel to generate at least one pixel of the scaled destination image

(*column 6 lines 22-24, 37-42, 58-63*), the scaled destination image having a different

resolution than the source image (*down sampled image has less pixels than the source*

*image*), wherein the available convolution kernels include at least one smoothing kernel

(*the coefficients at column 6 lines 21-22 has 1/10 at the boundary which brings more of*

*the distant pixel into the new pixel*) and at least one sharpening kernel (*and the*

*coefficient at column 6 line 38 has 1/15 at the boundary which brings less of the distant*

*pixel into the new pixel and has 7/15 in the middle pixel which brings more of the middle*

*pixel into the new pixel*).

Claim 3:

Lin does teaches storing at least two convolution kernels in a memory, however

at  column 8 lines 10-32 and 40-45 Lin describes the functions of figure 3 are performed

by a computer and associated software. Thus, the software at lines 40-45 would need to include the coefficients for the function of the image processor to be performed and the hard disk storing the software is a memory. Thus, in the software embodiment, the hard disk stores at least two convolution kernel coefficients. and in the generating step, either one of the stored convolution kernels is selected or another convolution kernel is generated by interpolating the stored convolution kernels.

Claim 6:

This claim claims wherein the local context metric has more than two possible values. Lin teaches this by filtering the white and black character and the background image separately, thus, Lin teaches three possible values for the context metric.

Claim 8:

This claim is a machine readable medium claim claiming the same functions of method claim 5, thus, this claim is rejected for the reasons given for claim 5 and in view of the discussion of software by Lin at column 8 lines 10-32 and 40-45.

Claim 10:

Lin teaches storing all available convolutions (*two, one for the background and one for the text*) in a memory (*column 8 lines 10-32 and 40-45* ) wherein in the generating step, one of the stored convolution kernels is selected based on the calculated local context metric. Lin does teach storing at least two convolution kernels in a memory, at column 8 lines 10-32 and 40-45 Lin describes the functions of figure 3 are performed by a computer and associated software. Thus, in the software embodiment,

the hard disk stores at least two convolution kernel coefficients and in the generating

step, either one of the stored convolution kernels is selected.

Claim 12:

This claim claims wherein the local context metric has more than two possible

values. Lin teaches this by filtering the white and black character and the background

image separately, thus, Lin teaches three possible values for the context metric.

Claim 14:

Lin teaches an image scaling device (*figures 2 and 3*) that receives pixels of a

source image (*figure 2, S*) and outputs pixels of a scaled destination image (*figure 3,*

*output of image merging unit 96*), said image scaling device comprising: a context

sensor (*column 2 lines 56-58, column 4 lines 47-50, and column 5 lines 5-12 and 21-34,*

*text segmentation unit 58 and image separation unit 66, Lin divides the image into tiles*

*and determines the tile's metric*) for calculating a local context metric based on local

source image pixels (*depending upon the tile's values one of three convolution kernels*

*is selected to be applied to the tile*); a kernel generator (*source of coefficients*) coupled

to the context sensor, the kernel generator generating a current convolution kernel from

a plurality of available convolution kernels (*column 6 lines 21-22, 37 and 58*) based on

the local context metric calculated by the context sensor; and a scaler (*78,86,72*)

coupled to the kernel generator, the scaler receiving the coefficients of the current

convolution kernel from the kernel generator, and using the coefficients to generate at

least one pixel of the scaled destination image from pixels of the source image (*column*

*6 lines 22-24, 37-42, 58-63*) , the scaled destination image having a different resolution

than the source image (*down sampled image has less pixels than the source image*),

wherein the available convolution kernels include at least one smoothing kernel (*the*

*coefficients at column 6 lines 21-22 has 1/10 at the boundary which brings more of the*

*distant pixel into the new pixel*) and at least one sharpening kernel (*and the coefficient*

*at column 6 line 38 has 1/15 at the boundary which brings less of the distant pixel into*

*the new pixel and has 7/15 in the middle pixel which brings more of the middle pixel into*

*the new pixel*).

Claim 18:

This claim claims wherein the local context metric has more than two possible

values. Lin teaches this by filtering the white and black character and the background

image separately, thus, Lin teaches three possible values for the context metric.

Claim 16:

Lin teaches an image scaling device (*figures 2 and 3*) that receives pixels of a

source image (*figure 2, S*) and outputs pixels of a scaled destination image (*figure 3,*

*output of image merging unit 96*),  said image scaling device comprising: a context

sensor (*column 2 lines 56-58, column 4 lines 47-50, and column 5 lines 5-12 and 21-34,*

*text segmentation unit 58 and image separation unit 66, Lin divides the image into tiles*

*and determines the tile's metric*) for calculating a local context metric based on local

source image pixels (*depending upon the tile's values one of three convolution kernels*

*is selected to be applied to the tile*);  a kernel generator (*source of coefficients*) coupled

to the context sensor, the kernel generator generating a current convolution kernel from

a plurality of available convolution kernels (*column 6 lines 21-22, 37 and 58*) based on

the local context metric calculated by the context sensor; and a scaler (*78,86,72*)

coupled to the kernel generator, the scaler receiving the coefficients of the current

convolution kernel from the kernel generator, and using the coefficients to generate at

least one pixel of the scaled destination image from pixels of the source image (*column*

*6 lines 22-24, 37-42, 58-63*) , the scaled destination image having a different resolution

than the source image (*down sampled image has less pixels than the source image*),

wherein the available convolution kernels include at least one smoothing kernel (*the*

*coefficients at column 6 lines 21-22 has 1/10 at the boundary which brings more of the*

*distant pixel into the new pixel*) and at least one sharpening kernel (*and the coefficient*

*at column 6 line 38 has 1/15 at the boundary which brings less of the distant pixel into*

*the new pixel and has 7/15 in the middle pixel which brings more of the middle pixel into*

*the new pixel*), the kernel generator stores (*column 8 lines 10-32 and 40-45* ) all

available convolution kernels (*two, one for the background and one for the text*), and the

kernel generator selects one of the stored convolution kernels as the current

convolution kernel based on the calculated local context metric. Lin does teach storing

at least two convolution kernels in a memory, at  column 8 lines 10-32 and 40-45 Lin

describes the functions of figure 3 are performed by a computer and associated

software.  Thus, the software at lines 40-45 would need to include the coefficients for

the function of the image processor to be performed and the hard disk storing the

software is a memory.  Thus, in the software embodiment, the hard disk stores at least

two convolution kernel coefficients and in the generating step, either one of the stored

convolution kernels is selected or another convolution kernel is generated by
interpolating the stored convolution kernels.

Claim 20:

This claim is very similar to claim 14 with the differences being this claim claims
in the preamble "A display device" rather than "An image scaling device" and claims at
line 11 "a display for displaying the scaled destination image". Lin teaches these
claimed features in the LCD panel 100 illustrated in figure 3.

Claim 22:

Lin teaches wherein the kernel generator stores (*column 8 lines 10-32 and 40-45*)
all available convolution kernels (*two, one for the background and one for the text*), and
the kernel generator selects one of the stored convolution kernels as the current
convolution kernel based on the calculated local context metric. Lin does teach storing
at least two convolution kernels in a memory, at column 8 lines 10-32 and 40-45 Lin
describes the functions of figure 3 are performed by a computer and associated
software. Thus, the software at lines 40-45 would need to include the coefficients for
the function of the image processor to be performed and the hard disk storing the
software is a memory. Thus, in the software embodiment, the hard disk stores at least
two convolution kernel coefficients and in the generating step, either one of the stored
convolution kernels is selected.

Claim 24:

Lin teaches an LCD panel 100.

### Claim Rejections - 35 USC § 103

6.     The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.     Claims 9, 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Lin, U.S. Patent No. 6,044,178, in view of Miyake, U.S. Patent No. 6,088,489.

Claim 15 claims  The image scaling device as defined in claim 14, wherein the context

sensor calculates a local context metric for each pixel in the destination image. Claims 9

and 21 claims the same limitations except for their dependency.  Lin does not teach

calculating a local context metric for each pixel in the destination image.  Lin at column

5 lines 5-12 teaches calculating a local context metric for a tile and at column 5 lines 35-

44 teaches calculating a local context metric for each line.  Thus, Lin teaches that

various sized areas of the image may be analyzed to calculate a local context metric.

Miyake at column 9 line 55 teaches calculating a local context metric for each pixel in

the destination image.  It would have been obvious to one of ordinary skill in the art at

the time the invention was made to calculate a local context metric for each pixel since

this will provide for better down sampling of the source image into the destination

image.

8.     Claims 7, 13, 19 and 25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lin, U.S. Patent No. 6,044,178, in view of Miyake, U.S. Patent No.

6,088,489. These dependent claims are very similar and only differ due to their dependency and type of claim, eg. method, device, etc.         Lin teaches a complete sharpening kernel and the complete smoothing kernel as described in the rejection of claim 14. In addition the term complete is read to mean a complete kernel capable of sharpening or complete kernel capable of smoothing.

Lin fails to teach the following limitation of claims 7, 13, 19 and 25 "a plurality of other kernels that provide a transition between the complete sharpening kernel and the complete smoothing kernel".

Miyake describes a filtering system that selects a kernel based upon local properties of the image.

Miyake teaches the available convolution kernels include at least one smoothing kernel (*column 9 lines 51-55, to prevent the fine lines from being cut, a smoothing kernel is inherently used*) and at least one sharpening kernel (*column 9 lines 51-55, to prevent the corners from being smoothed , a sharpening kernel is inherently used*).

Since Miyake teaches selecting from among a plurality of filters a filter necessary to filter the image then Miyake suggests a plurality of kernels between smoothing and sharpening.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicants invention to have a plurality of other kernels in Lin that provide a transition between the complete sharpening kernel and the complete smoothing kernel because this will allow Lin to filter images having inseparable text and background or inseparable white and black text or lines and corners.

## *Prior Art*

9.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hrytzak et al, U.S. Patent No. 5,327,257, teaches sharp interpolating each pixel of an image, soft interpolating each pixel of the image, determining the local characteristics of the image around the pixel, and combining the soft and sharp interpolated pixels based upon the determined local characteristics to form a filtered image.

Mahmoodi, U.S. Patent No. 5,774,601, teaches selecting either a sharpening filter kernel or a smoothing filter kernel depending upon input variables.

Kikuchi et al., U.S. Patent No. 6,603,888, teaches scaling an image with a sharpening filter, nearest neighborhood, or a smoothing filter, bilinear approximation, or a combination of the two in response to the output of a coefficient selector 11.

Li et al., U.S. Patent No. 5,602,934, teaches structure adapted filtering.

## *Allowable Subject Matter*

10.     Claims 4 and 2 are allowed.

11.     Claims 11, 17, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12.    The following is a statement of reasons for the indication of allowable subject

matter:

Claims 4 and 2:

Claim 4 is allowable in view of Lin even though Lin stores the convolution

kernels, as described above, however, Lin does not teach or suggest the last two lines

of claim 4, wherein in the generating step, either one of the stored convolution kernels is

selected or another convolution kernel is generated by interpolating the stored

convolution kernels.

Claims 11, 17 and 23:

See the reasons given for claim 4.


13.    All claims are drawn to the same invention claimed in the application prior to the

entry of the submission under 37 CFR 1.114 and could have been finally rejected on the

grounds and art of record in the next Office action if they had been entered in the

application prior to entry under 37 CFR 1.114.  Accordingly, **THIS ACTION IS MADE**

**FINAL** even though it is a first action after the filing of a request for continued

examination and the submission under 37 CFR 1.114.  See MPEP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.  In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

14.    Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Jeffery A. Brier whose telephone number is (703)

305-4723.  The examiner can normally be reached on M-F from 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Michael Razavi, can be reached at (703) 305-4713).

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C.  20231

**or faxed to:**

**(703) 872-9306 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal

Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jeffery A Brier
Primary Examiner
Art Unit 2672